

3 theses } immediately after this: brief statement about traditional scientific reaction (see slides) - react against it of this paper
of 'reaction and instrumentalism' - diff. ways of formalizing structure
of 'No miracles' or 'Pessimistic meta-theory'

- 1) not clearly articulated, inadequate as theories of dialectic of scientific development (study history)
- 2) simple versions do real harm to science (study history)
- 3) best scientists have changed incorporated elements of both in their thought (best includes most sophisticated as well as most successful, deepest)

Skeptical
 → it must move back and forth between them in a dialectic manner, always incorporating aspects of each, emphasizing some over others at different times, in different contexts

Societas (Lipman) not Pyrrho (Athenian)
 ⇒ the recognition that one is not in a position to know, then contrary (apparently) sides to a debate both being strong, cogently and independently possible that need to be taken account of
 not a suspension of belief because neither side can ever claim total victory
 → with the recognition that this should be a spur to further thought and investigation

→ "reaction" and "instrumentalism" as 'theories of dialectic of scientific development' ⇒ a much richer conception of the ideas themselves, and what is at stake in the debates than the usual conceptions, which views the ideas as a basis for the way to interpret and understand scientific theory as a static totality
 (though the debate does look forward history of science for evidence for and against each position, as motivation and inspiration for arguments)

Waters (1978) in reply (labels (p. 48): understood concepts, not just accept labels which can lead to a deepening of the objects they understand

Central contrast, its characterization, is tolerably clear, from the pov of realists

"hasty applying labels": can lead one to think one understands the concepts, deceives the capacity to dig deeper, to realize one's own confusions, to ask further questions and truly listen with respect and appreciation and so think about seriously apparently contrary positions

[⊕ why 'causal theory of reference' is damaging - it is a 'hasty applying labels']

- falling for 'nothing but' and 'something more'
 "instrumentalism: theory are 'nothing but' tools for calculating outcomes of exps"
 ⇒ exps from 'special domain' - "quantified firm views about what the world really is" ⇒ Wigner's remark shows that theories characterize the world in a richer and deeper sense - the world of (broadly Kuhn) experience
 → how the world really is

Lecture: ϕ stan - 'Yes, but...'

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②

\Rightarrow true form of debility instrumentalism shallowly and superficially limits scope of theory \Rightarrow an instrument - theories as "instruments" is how as their scope the phenomena of nature

\Rightarrow an understudy (not just "calculator") in fundamental terms, qualitative & quantitative properties of ordinary matter



deeper, more sophisticated characterization of "instrumentalism":

- theories as "nothing but" instrument for repr'ing phenomena'



now, turn to realist: what more do you want?

\Rightarrow standard under as false & shallow is standard form of instrumentalism.
- we want that terms 'genuinely refer', that its sentences are determinately true or false

2 probs

- 1) Kant: if reference ^{exists} at all, go beyond correctness and adequacy of rep, how can we know this? \rightarrow further beyond knowledge
- 2) one can "Tarskianize" anything (Carnap's point) \rightarrow false utility found

Boyd's proposal for 'more' (pp. 51-52)

connection of theories w/ ongoing progress of sci' inquiry reflects evidence

[ent: theory of sci' development] that theories have "real" validity

\Rightarrow provides in the end only pointing out what instrumentalists need to give theories as instruments for - basis for ongoing, continuation of sci' inquiry

\Rightarrow the instrumentalist can do this if method principles of inquiry are grounded in rel'n of theory to phe, & instrumentalist ought to adopt these principles then on grounds of instrumental success
 \rightarrow & if principles not susceptible to further in terms of rel'n between theory and phe, back to Kantian problem

\Rightarrow and it can't be that the realist can explain the success of the method principles in way that instrument can't, until realism is more than bare nominal claims

\Rightarrow and it can't be IBE, because then 'explanation' (viz. hypothesis so abducted) can't be subject to further investigation, viz. testing

recall - all Stan's eyes so far we in spirit of searching for clarification of the realist thesis (content of the)

⇒ no alleged evidence in favor of realism remains rationally convincing until realist thesis is clearly clarified

⇓
Fertility of hypothesis (pp. 53-56)

1) example of color perception ⇒ "obj's really have colors" - still need to explain fact that perception is mediated by energy/mass transfer and stimulation of neurons, which was not originally said to be incapable of supporting "real explan" ⇒ "explanation disconnected from explanandum"

2) Haynes points Bourne mechanism w/ no plausible 'explanandum' itself ⇒ "judgment skewed by desire to feel it understood" ⇒ both exhibit relaxation of intellectual standards under ideological pressures (degrees of ideology, of attacking oneself indissolubly to a position and being hell bent to defend it even what not)

genuine & interesting questions/issues / real role of theory in ongoing scientific inquiry (pp. 56-59)

- ⇒ do not divide naturally along line of 'realism/instrumentalism'
- 1) emphatic double standard of 'judgy realism' of diff't entities (Poincaré)
 - 2) shallow realist tendency to take some terms for referential fact to refer based on historical usage (either/atom à la Putnam)

⇓
rather we have learned that successful theories are to be taken very seriously as clues to deeper understanding of phs, i.e., clues for search for better more fundamental theories
⇒ but none of this has anything to do w/ referential sense or ontology
⇒ rather: Putnam was right, what persists are math'l forms that phs 'partake of' or 'imitate' (are copied by)

problems w/ instrumentalism (pp. 60-61)

\Rightarrow distract attention from / blind us to prob. of real and deep significance, as in QM (which realism also does, w/ its focus on exact reference of ontology, properties of attributes)
instrumentalism: no need for realism, we know how to apply them in practice - but ^{we don't understand} _{all uses of interest} \Rightarrow no diff between enlightened of object realism and sophisticated instrumentalism

(pp. 61-65)

- analogy between trying to refute Berkeley and "need" to postulate underlying "mechanical" ether to support EM phs

Maxwell's position: ^{"realist"} represent state & dyns of EM field in as abstract form as possible, w/o detailed reference to 'mechanisms by which' that state is constituted & those dyns manifested } instrumentalist

Because we don't understand 'mode of rep of phs by math - all phs of world probably mean prob

\Rightarrow his success (partial, completed later by Lorentz) in showing his theory under fire of EM is what persisted in later developments of more fundamental theories, even as that very subsumption ended up showing impossibility of grounding EM phs in "mechanical ether" as traditionally construed

Lorentz's completion of Maxwell's program: "instrumentalist"

\Rightarrow have to square Lorentz's 'instrumentalist' view of usefulness of their rep's w/ Maxwell's 'realist' views, that Lorentz approvingly cites?

\Rightarrow there is an contradiction at bottom - both attitudes are used fruitfully, as quote from Maxwell's Encyclopedia which on "Attraction" shows

No Miracles, and Berkeley again

no more miraculous that our perceptions, ^{if that is all they consist of} follow rules formulated in terms of "entities" postulated by sci[?], than universal gravity, or EM w/o a mechanical ether that "just does" satisfy Maxwell's eqns in L^oin formulation
 \Rightarrow indeed you 'explanation' of properties of ordinary objects seems itself "miraculous" given that we have no true "understanding" of it (of QM's 'mode of rep')
 \Rightarrow for me: no more miraculous that exps always produce same outcomes than that things always behave the same way 'in nature' w/o further